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Getting the evidence for evidence-based initiatives: how the Midwest states use data systems to improve education processes and outcomes

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June 2007

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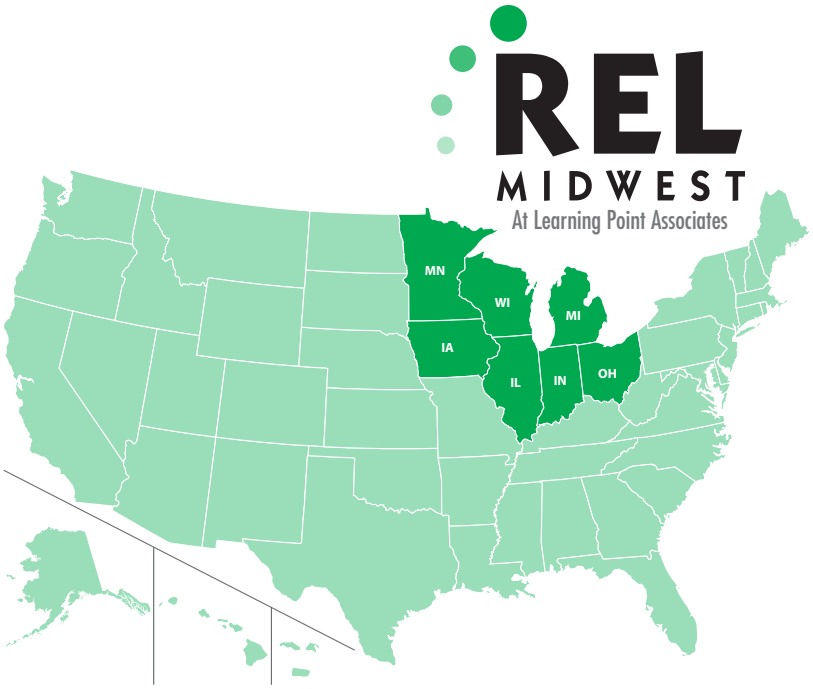

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Summary

Getting the evidence for evidence-based initiatives: how the Midwest states use data systems to improve education processes and outcomes

States in the Midwest Region are developing innovative approaches to collecting and providing access to high-quality data in order to improve educational decisionmaking. Additional capacity-building and increased technical assistance at the state and local levels would enhance this work.

Educational improvement through data-based decisionmaking using high-quality data is a longstanding goal of policymakers and practitioners, and ensuring the quality of the evidence available to inform such decisions is a key part of the No Child Left Behind Act of 2001. The evidence-based education that such initiatives promote involves the "integration of professional wisdom with the best available empirical evidence in making decisions about how to deliver instruction." A wealth of data at the school, district, state, and federal levels should in principle provide an empirical basis for developing educational policies, practices, and research proposals and designs.

The states in the Midwest Region are developing innovative practices for identifying and addressing information priorities within their states and for meeting federal requirements. These exemplary practices involve establishing longitudinal student-level and teacher-level data collections and linking data across the educational information system. Other practices include incorporating key data elements that can leverage other data resources to identify problems that could constrain student achievement and using accountability systems to target educational resources more efficiently and effectively.

Midwest states also face challenges in meeting these goals. Data collection staff and resources for training at the local level are limited, and many states do not have enough staff with the skills and experience necessary to analyze the data. Keeping the duplication of data collection to a minimum is also a constant challenge. Finally, federal and state regulations often constrain states' ability to collect key data elements.

Given these challenges and constraints, responding to states' information needs and aspirations may best be achieved through a

two-pronged approach. First is to establish regional benchmarks and provide guidelines for states wishing to use local data to develop indicators for purposes of comparison. Second is to respond to specific state requests for analytic resources and develop associated training materials. Both tasks have the explicit goals of providing immediate utility and building capacity for the future. Each may usefully be addressed by the regional educational laboratories—singly, in combination, and with external partners.

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States in the Midwest Region are developing innovative approaches to collecting and providing access to high-quality data in order to improve educational decisionmaking. Additional capacity-building and increased technical assistance at the state and local levels would enhance this work.

Educational improvement through data-based decisionmaking using high-quality data is a longstanding goal of policymakers and practitioners, and ensuring the quality of the evidence available to inform such decisions is a key part of the No Child Left Behind Act of 2001 (NCLB). The evidence-based education that such initiatives promote involves the "integration of professional wisdom with the best available empirical evidence in making decisions about how to deliver instruction." A wealth of data at the school, district, state, and federal levels should in principle provide an empirical basis for developing educational policies, practices, and research proposals and designs. But the objectives of data-based decisionmaking in education have not been fully realized.

Major factors contributing to this situation include data quality problems, outdated or incompatible systems and processes, organizational cultures that do not support data use for educational improvement, insufficient capacity to use multiple datasets efficiently, and a variety of organizational, logistical, and regulatory restrictions on making data—particularly individual-level student and teacher data—accessible to multiple audiences (Bernhardt, 2004; Massell, 2001; Streifer, 2004; U.S. General Accounting Office, 2005). There is thus a need to:

- Assist state education agencies in enhancing the quality of state data.
- Build capacity to leverage data to inform decisions and enhance strategic planning.
- Provide technical and analytic assistance to states.

This report describes the results of the first year of the REL Midwest Task 1.2 fast response project, *Using Multiple Levels of Data to Address Educational Issues in the Region,* which seeks to address these needs (see box 1). Information obtained from the states in this study helps to define exemplary practices, common data problems, and analytic opportunities in the Midwest Region.

EXEMPLARY PRACTICES

The states in the Midwest Region clearly embrace—and several have

BOX 1

Objectives of the study

The objectives for this task were to:

- Conduct a needs assessment to document current and expected priority information needs of each state in the Midwest Region, including information that would enable states to move beyond compliance with reporting requirements toward more proactive strategic planning.
- Develop and complete data inventories for each state in the Midwest Region to document the structure of the state's educational data system and identify issues related to data quality, collection, and reporting.

The approach was twofold (see appendix A). First, key state education agency officials were interviewed about their state's data system, including pressing requirements and current challenges. Second, state data inventories were completed to provide an overview of each state's educational data system. To reduce the burden on respondents, these inventories were completed using information publicly available in print and online formats. In addition, federal agency staff were contacted to provide additional perspectives for contextualizing issues identified in the state education agency interviews, especially for federal-based initiatives, such as statewide longitudinal data systems (SLDS), the Education Data Exchange Network (EDEN), and data use and accessibility issues associated with state regulations and the Family Educational Rights and Privacy Act (FERPA).

developed—innovative practices for identifying and addressing information priorities within their states and for meeting federal requirements. Frequently these meet or exceed the additional steps that the Data Quality Campaign describes as fundamental to developing robust longitudinal data systems.[2] Often they go beyond traditional practice, developing, adapting, or adopting innovative approaches to collecting, ensuring the quality of, and providing efficient and timely access to data for a range of planning and decisionmaking purposes. Many are what the Federal Emergency Management Agency characterizes as *exemplary*—ideas, projects, programs, techniques, or methods that have "worked in one place and may be worthy of adopting elsewhere."[3]

Typically these exemplary practices involve establishing longitudinal student-level and teacher-level data collections, linking data across the educational information system, including key data elements that can leverage other data resources to assist in the early identification and treatment of problems that have the potential to constrain student achievement, and using accountability systems to target educational resources more efficiently and effectively.

Establishing individual-level longitudinal data systems

All states in the Midwest Region have—or are in the process of establishing—individual-level student or teacher longitudinal data systems.

In Michigan the Center for Educational Performance and Information, established in 2000, collects individual-level student data through the Single Record Student Database, one of five elements of the Michigan Education Information System data warehouse system.

Iowa's Project EASIER (Electronic Access System for Iowa Education Records) allows the electronic transfer of individual student data from school districts to the Department of Education to compile state and federal reports—and the exchange of student records between school districts when students transfer between schools in the state. The Department is working with postsecondary institutions to accomplish the electronic transfer of high school transcripts to postsecondary institutions.

Indiana's Student Test Number system, operational since the 2002/03 school year, has been used to collect a variety of student-level longitudinal

data, including demographic information, enrollment, special program participation, dropout, graduation, and other achievement data.

Since the 2004/05 school year Wisconsin has assigned unique statewide student identifiers, providing the capacity to link student-level records across all the state's student-level databases.

Minnesota also assigns unique student identifiers, and in 2005 received—along with the states of Michigan and Wisconsin and the Wisconsin Center for Education Research—a federal Statewide Longitudinal Data Systems (SLDS) grant to support developing a comprehensive multistate longitudinal data system.

In Ohio a third party vendor assigns unique statewide student identifiers to public school students; these identifiers can be linked to individual students only at designated data acquisition points, protecting student privacy while enabling longitudinal tracking of student performance across the state using data submitted through Ohio's Education Management Information System. In 2006 the Ohio Department of Education in collaboration with local education agencies, regional information technology centers, and other entities received funding from the SLDS program to support the Data-Driven Decisions for Academic Achievement (D3A2) project, increasing to four the number of states in the Midwest Region that have received SLDS funding (of 14 awards under that program to date).

In 2005/06 Illinois began to implement the state Student Information System, which assigns unique student identification numbers to each public school student in the state. This system also collects and stores demographic, graduation, dropout, and other information. Although the Illinois Student Information System does not store any information on teachers, its Teacher Service Record collects information on current positions and assignments for all teachers currently employed in the state.

Clearly, all states in the region recognize the importance of access to individual-level data longitudinally. Typically the establishment of student-level systems is given priority over teacher/staff systems, although many states have made significant strides in this realm as well. As noted above, several have obtained outside funding to support the development of student-level longitudinal data systems; others have worked to develop student-level systems by reallocating resources. Several states have also taken steps to begin what are generally envisaged as multi-year efforts to establish data warehousing systems (Iowa, Minnesota, Michigan, Ohio). Others are eager to move in this direction (Indiana, Illinois), building steps to achieve this goal into their strategic plans and making requests for funding to state legislative bodies. With the establishment of such data enclaves, states in the Midwest Region will move closer to attaining a series of shared objectives: to link data at the state level and to make it easier for local entities to add value with their own local data to enhance decisions about educational policies and practices not only at the state level but also at the district, school, and classroom levels.

Linking data across the educational information system

Implicit in the attainment of the state's most proactive objectives for their data is the ability to link data from multiple sources. An obvious (but for many states currently unattainable) goal is the ability to place students in their classrooms with their teachers—that is, to link student and teacher data. Several states hold multiple years of student-level demographic, enrollment, and achievement data—all of which can be linked—but have no system to easily link teacher with student data. Obstacles to establishing these links include addressing teacher unions' concerns with the confidentiality of individual teacher data.

An obvious (but for many states currently unattainable) goal is the ability to place students in their classrooms with their teachers

Another common objective is to extend the utility of preK–12 data by developing links with

postsecondary education data systems. While several states have plans in place or are developing strategies to address this priority, constraints include:

- The absence of a common identifier across student-level K–12 and postsecondary record-keeping systems.
- The absence of a suitable data warehousing infrastructure. Several states are conducting reviews to identify opportunities to develop systems to gather such data; the results of these reviews may well prove valuable to other states in the region and the country overall.

Another common objective is to enrich existing data collections with additional data elements, such as course-taking and course-completion data for students, and for teachers, details of their pre- and post-certification training and professional development activities. The former can prove essential in understanding how particular forms of instruction and course-sequences affect educational outcomes; the latter can be important in identifying and targeting effective professional development practices.

Frequently states seek education data not just for themselves but for individual teachers and their principals, enabling practitioners to see what best practices are characteristic of their schools, the factors promoting their use, and their ultimate outcomes

Developing diagnostics

The goal of developing mechanisms and procedures to link student with teacher or student preK–12 with student higher education data is to identify, diagnose, and intervene to remediate situations that, unchecked, are likely to lead to undesirable student learning outcomes. Frequently states seek this information not just for themselves but for individual teachers and their principals, enabling practitioners to see what best practices are characteristic of their schools, the factors promoting their use, and their ultimate outcomes. States seek to forge preK–12 links with postsecondary data in order to highlight high school experiences and clarify which high schools are better at preparing their students for college—and why. They expect to link student with teacher data to identify teacher professional development practices that do (and do not) lead to improved student achievement and to outstanding instructors and instructional practices. Another goal is to link teacher preparation with teacher mobility and attrition data in an effort to understand why instructors from some of the best teacher preparation programs and courses decide to leave the teaching profession at various stages in their careers. States also seek to enhance student-level record systems with course-taking and course-completion data to assist district officials and teachers in understanding the relationship between classes, courses, and performance.

Several states have identified key data elements that will help with early identification of problems (for example, course-taking and course-completion, family involvement, and school climate). In some cases this data already exists within the state system and simply needs to be reported; in others, additional data collection may be required.

Using accountability data

Several states seek to go beyond the accountability requirements of the No Child Left Behind Act and other state and federal mandates, using accountability data to monitor progress and target resources more efficiently and effectively. Examples include initiatives to:

- Identify schools that are making significant progress (such as moving students from the bottom to the next quartile), even if they are not necessarily moving all students to proficiency or making adequate yearly progress.
- Identify how funds are being allocated (such as supporting teacher professional development).
- Establish the differences such resources are making on intermediate and final educational outcomes (such as the impacts of professional development activities on the career development

of individual teachers, on particular categories of teachers, and on the educational attainment of their students).

- Target resources more efficiently (say, on individualized education programs and limited English proficient activities and programs).
- Use achievement data in a more timely fashion (supporting continuous assessment within the classroom).

CHALLENGES AND CONSTRAINTS

The foregoing exemplary practices notwithstanding, efforts to address information needs across the Midwest Region are frequently hampered by a combination of factors. Common challenges include analytic capacity, staff, and other resource constraints; data burden; and concerns with the implications of the Family Educational Rights and Privacy Act and related state and federal regulations.

Analytic capacity, staff, and resource constraints

Several states commented on the difficulty of conducting noncompulsory analyses of existing data given current staff resources. Some states have had to cut staff—accomplishing more tasks with fewer resources. Others have tackled the challenges of moving to individual-level data collection using resources originally designed for aggregate data collection. A common challenge is to recruit and retain skilled analysts given salary differentials in public education and other sectors. Turnover at the local level also contributes to state-level resource constraints. When training in the use of new data collection and reporting systems is accomplished by reallocating state education agency officials' time to serve as local trainers, high turnover at the school and district level has implications for state education agency staff. Such problems could be resolved by hiring additional skilled analysts or providing additional professional development for existing staff. Another option is to provide external analytic capacity.

Data burden

States in the region seek to provide both state and local actors with specific information to guide policy development and practice. Several initiatives are already in place and others are in the planning stage. Even so, many of these aspirations have yet to be realized. Factors currently affecting the ability of states to collect the data necessary to meet these objectives include:

- An inability to provide resources to local officials (at the school or district level), on whom considerable extra burden is placed with a move from aggregate to individual reporting of data elements.
- The absence of a legal authority to collect additional data.

Avoiding duplication in data collection. One way to reduce the burden is to restrict (if not eliminate) duplicative data collections. A key strategy for achieving this objective in several states in the region is establishing data warehouses and integrating records in databases that can be queried to extract information for multiple purposes. Such systems can be stimulated by a state education agency data culture (Michigan's educational data mission is "to collect once, store once, and use many times"). Or they can be pursued in response to legislative mandate (Michigan's Public Act 180 of 2003 authorizes the Center for Educational Performance and Information to coordinate data collection in an effort to reduce districts' reporting burden and prevent duplicate data collections). The expected result: more efficient and effective data collection, storage, querying, and reporting capacities. An added

A key strategy for reducing data burden is establishing data warehouses and integrating records in databases that can be queried to extract information for multiple purposes

benefit of such a strategy is the reduced likelihood of introducing inaccurate data into the system (assuming appropriate quality control and reasonability checks are in place to ensure the validity of data as it is added to the system).

Data burden is also an issue when requests to report the same data in multiple forms (as in compliance with multiple federal collections and in response to state and district officials' and other stakeholders' information requests). Initiatives already under way at the federal level to address some of these issues (such as streamlined collection of CCD and compliance data through EDEN) may free some scarce staff resources for reallocation to other state data needs and aspirations.

Establishing legislative authority to collect data. Another significant challenge to leveraging the full benefits of data already collected is the inability to enrich that information with additional data that could be used to develop causal inferences regarding the factors contributing to various student learning outcomes. Key here are statutory requirements that can preclude the collection of data at the state level without specific legislative authority. An example is Indiana, a local control state. The state constitution provides that any authority not specifically given to the central government reverts to the local level—in the case of education, the school boards are the legal entities controlling the educational system. As a result, all educational data reporting is completely voluntary unless specifically required by a state board rule or state law. Similarly in Michigan data collection activities must be state or federally mandated; the state has no authority to collect data not required for compliance with such mandates.

A culture is developing within states and across the region in support of sharing data to inform decisionmaking at multiple levels in the educational system while minimizing the burden of multiple collections

Implications of the Family Educational Rights and Privacy Act and state regulations

While acknowledging the important protections under the Family Educational Rights and Privacy Act and other federal (such as the Protection of Pupil Rights Amendment, PPRA[4]) and state regulations, several states underscored the constraints such regulations place on their ability to extract the full value of the data they already collect for other purposes. Concerns here include the ability to return to districts and schools data collected and processed by the state, and the ability of K–12 and higher education institutions to share data while still protecting the rights of both students and their families. A culture is developing within states and across the region in support of sharing data to inform decisionmaking at multiple levels in the educational system while minimizing the burden of multiple collections. States support allocating resources to these efforts—but remain concerned that these goals are unachievable given FERPA and other regulations.

ANALYTIC POSSIBILITIES

Given the challenges and constraints, responding to states' expressed information needs and aspirations may best be achieved through a two-pronged approach. First is to establish regional benchmarks and provide guidelines for states wishing to use local data to develop comparable indicators for purposes of comparison. Second is to respond to specific state requests for analytic resources and develop associated training materials. Both tasks have the explicit goals of providing immediate utility and building capacity for the future. Each may usefully be addressed by the regional educational laboratories—singly, in combination, and with external partners. Here are suggestions for steps that REL Midwest might usefully take to provide additional analytic support to the states in this region.

Providing regional benchmarks

In the absence of long-standing longitudinal student or teacher data at the state level, it can be challenging to undertake the trend analyses required to establish appropriate benchmarks for establishing performance objectives, assessing and understanding factors influencing outcomes, and

selecting or developing interventions to enhance performance. Initiatives under way in several states in the Midwest Region to develop statewide longitudinal data systems will provide the data necessary to develop key state-level indicators in the future. While such systems continue to mature, several priority information needs and aspirations can be addressed through analyses of major secondary sources—alone or in combination with existing state data. Examples include:

- Providing benchmarks for monitoring growth in student achievement (including comparisons across similar types of students, and for students enrolled in similar types of schools) both nationally and in the Midwest Region.
- Providing benchmarks for monitoring states' performance relative to other states in the Midwest Region, nationally, and internationally.
- Providing benchmarks to assist states in assessing the performance of specific subgroups or subpopulations of students.
- Identifying teacher professional development and other factors associated with teachers' job satisfaction and high growth in student achievement.

Responding to requests for analytic resources: Addressing immediate information needs while building capacity for the future

This study suggests numerous areas where states would benefit from access to analytic resources that would assist them in resolving information needs to move beyond compliance with federal and other reporting requirements toward more proactive strategic planning for educational process, system, and outcome improvements. One example is creating an "at-risk" profile for high school students. A second is using existing data dictionaries to create metadata structures. A third is identifying key outcomes associated with various teacher professional development activities and opportunities and factors affecting teacher mobility and retention rates (say, by district).

Another source of support would be to develop associated training materials that would provide professional development capacity building resources to interested states. Such training materials might specify the data elements and required data quality, methodologies, analytic approaches, and procedures for resolving specific information requirements using available state data. They might also specify the procedures for resolving similar information requirements using data states anticipate having access to in the future, as longitudinal data systems mature and technical and regulatory issues affecting the ability to link data from multiple sources for particular purposes are resolved.

Facilitating a comprehensive, systematic approach to realize the objectives of data-driven decisionmaking

The No Child Left Behind Act is a push toward creating the individual-level accountability data systems that can be used to inform decisions on educational policies and practices at the federal, state, district, school, and classroom levels. The states seek to do much more than meet such compliance requirements. They recognize the exciting and important opportunities individual-level longitudinal data systems create to be proactive, to identify at-risk populations, to target interventions earlier, and to monitor their impacts, quickly adjusting policies and programs as required.

Many states in the region, having already gone far beyond recognizing these opportunities, are developing plans and committing resources to achieve them. With different opportunity structures and different experiences addressing these issues, they have the potential to provide considerable practical experience to each other. State education agency officials in the region have much in common in their objectives for their educational data systems. This analysis suggests important opportunities exist to capitalize on the states' commitments to data-driven decisionmaking and enhance their opportunities to realize its potential by thinking about these issues more comprehensively and systematically.

NOTES

1. See "Evidence-Based Education (EBE)," June 9, 2003 presentation by Grover J. (Russ) Whitehurst, then Assistant Secretary, Educational Research and Improvement, United States Department of Education, available online at http://www.ed.gov/offices/OERI/presentations/evidencebase.ppt (link verified March 9, 2007).

2. See "Fundamentals in Designing State Longitudinal Data Systems," online at http://www.dataqualitycampaign.org/survey_results/fundamentals.cfm.

3. See *Partnerships in Preparedness: A Compendium of Exemplary Practices in Emergency Management, Volume II – May 1997*, available online at http://www.fema.gov/emergency/managers/partnr02.shtm.

4. See http://www.ed.gov/policy/gen/guid/fpco/ppra/index.html.